REMARKS

Applicants respectfully request reconsideration and allowance of the pending claims.

I. Status of the Claims

Upon entry of this amendment, claims 1-13, 28-33, and 36-38 remain pending. Claims 14-27 and 34-35 have been canceled. Claims 39-41 are new.

Claim 1 has been amended to require the film further comprise a perfluorinated counterion within the bulk of the interpenetrating network of the net positively charged polyelectrolyte polymer and the net negatively charged polyelectrolyte polymer, the perfluorinated counterion comprising at least two fluorine atoms. Claim 1 is supported by original claims 1, 25, and 25, in the specification at paragraphs [0005] and [0043], and by Example 10 "Doping of Fluorinated Multilayer by a Fluorinated Counterion".

With regard to the limitation of a perfluorinated counterion having at least two fluorine atoms, the written description requirement may be satisfied by implicit and inherent support in the specification for the claim limitation. Compliance with the written description does not require *ipsis verbis* support, i.e., literal word for word support. See MPEP §2163.05: To comply with the written description requirement of 35 U.S.C. **112**, para. 1, or to be entitled to an earlier priority date or filing date under 35 U.S.C. **119**, **120**, or **365(c)**, each claim limitation must be expressly, ***implicitly***, or ***inherently*** supported in the originally filed disclosure.

In the applicant's specification at paragraph [0005] "perfluorinated" is defined in the context of a polymer as a polymer comprising repeat units "that bear a plurality of

fluorine groups (at least two)." This definition of "perfluorinated" provides implicit support for "perfluorinated counterion" as a counterion that bears a plurality of fluorine groups, i.e., at least two.

Paragraph [0043] provides further support for this definition by describing specific types of perfluorinated counterions that comprise at least two fluorine atoms. Moreover, the perfluorinated counterion actually used by the inventor in Example 10 possessed at least two fluorine atoms -- this is an inherent property that is necessarily present in the molecules that the inventor employed and now claims.

Written description does not require explicit description of every feature, i.e., ipsis verbis support is not the standard for compliance with the written description requirement. See, for example, *In re Alton*, 76 F.3d 1169, 37 U.S.P.Q.2d 1578 (Fed. Cir. 1996):

> If, on the other hand, the specification contains a description of the claimed invention, albeit not in ipsis verbis (in the identical words), then the examiner or Board, in order to meet the burden of proof, must provide reasons why one of ordinary skill in the art would not consider the description sufficient. Id. at 264, 191 USPQ at 98. ... ***If a person of ordinary skill in the art would have understood the inventor to have been in possession of the claimed invention at the time of filing, even if every nuance of the claims is not explicitly described in the specification, then the adequate written description requirement is met.*** For example, in Ralston Purina Co. v. Far-Mar Co., Inc., 772 F.2d 1570, 1576, 227 USPQ 177, 180 (Fed. Cir. 1985), the trial court admitted expert testimony about known industry standards regarding temperature and pressure in "the art of extrusion of both farinaceous and proteinaceous vegetable materials." The effect of the testimony was to expand the breadth of the actual written description since it was apparent that the inventor possessed such knowledge of industry

> standards of temperature and pressure at the time the original application was filed.

Under the rule of *In re Alton*, the specification need not describe explicitly every detail of the claim limitation; the specification must only describe enough so that the ordinarily skilled person would have understood the inventor to be in possession of the polyelectrolyte film comprising a perfluorinated counterion comprising at least 2 fluorine atoms and which is further incorporated into the interpenetrating network of polyelectrolyte polymers.

Description of empirical work actually done by the inventor is strong evidence that the inventor possessed the invention at the time of filing the original disclosure. Example 10 at paragraph [0142] describes a polyelectrolyte film actually prepared by the inventor that provides support for the polyelectrolyte film defined by claim 1. Example 10 describes a method for preparing a polyelectrolyte film in which a perfluorinated counterion comprising at least 2 fluorine atoms becomes incorporated into the interpenetrating network of polyelectrolyte polymers. In Example 10, 4-vinyl-trideca-fluoro-octyl pyridinium-co-4-vinyl pyridine (PFPVP) was layered with Nafion, thereby forming an interpenetrating network of a net positively charged polyelectrolyte polymer comprising repeat units with at least two fluorine atoms a net negatively charged polyelectrolyte polymer comprising repeat units with at least two fluorine atoms. This film was dipped in a solution of perfluorotetradeconoate (a perfluorinated counterion), which became incorporated into the bulk of the interpenetrating network, as confirmed by empirical data shown at FIG. 9. This Example 10 unambiguously shows that the inventor possessed a polyelectrolyte film comprising the oppositely charged polymers

with a fluorinated counterion located within the bulk of the interpenetrating network of the polyelectrolyte polymers (i.e., the film defined by claim 1) at the time of the filing date of the application and that the ordinarily skilled person would have been able to recognize that an invention meeting all of the limitations of the claims was adequately described in the specification. See also *Moba B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 1302 (Fed. Cir. 2003) (the description requirement "has always required sufficient information in the original disclosure to show that the invention possessed the invention at the time of the original filing"); *Purdue Pharma L.P. v. Faulding*, 230 F.3d 1320, 1323 (Fed. Cir. 2000) ("Put another way, one skilled in the art, reading the original disclosure, must immediately discern the limitation at issue in the claims.")

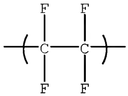
Claim 12 has been amended to require a "perfluorinated charged particle comprising repeat units with at least two fluorine atoms."

In the applicant's specification at paragraph [0005] "perfluorinated" is defined in the context of a polymer as a polymer comprising repeat units "that bear a plurality of fluorine groups (at least two)." This definition of "perfluorinated" provides implicit support for "perfluorinated charged particle" as a particle that bears a plurality of fluorine groups, i.e., at least two.

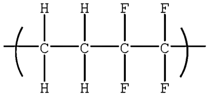
The published application at paragraph [0012] discloses the polyelectrolyte film comprising the polymer polyelectrolyte and the fluorinated charged particle. Paragraph [0097] of the published application describes several types of fluorinated charged particles, including polytetrafluoroethylene or ETFE. The description of these particles is sufficient to show that

the inventor possessed the invention as claimed as of the original filing date since these particles inherently comprise repeat units having 2 or more fluorine atoms.

Polytetrafluoroethylene has the following repeat unit:



ETFE, ethylene tetrafluoroethylene, has the following repeat unit:



Each of these polymers comprise repeat units having 4 fluorine atoms, which is inherently meets the "at least two fluorine atoms" requirement. The number of fluorine atoms of these polymers is inseparable from the polymers themselves.

Paragraph [0105] describes a method for preparing the films described in paragraph [0012], in particular, "A preferred FP dispersion comprises polytetrafluoroethylene." This particle inherently comprises at least 2 fluorine atoms, as shown above.

II. Elections/Restrictions

Applicants have canceled claims 14-27 and 34-35.

III. Double Patenting

Applicant acknowledges the provisional rejection of claims 1-13, 28-33, and 36-38 on the ground of nonstatutory obviousness-type double patenting over claims 1-4 and 7-17 of co-pending application Ser. No. 11/130,972 (published as U.S. 2005/0287111). Unless and until the co-pending application

matures into a patent or the double patenting rejection is the sole remaining rejection in the present case, the appropriateness of this rejection cannot be ascertained. Applicant therefore requests the double patenting rejection be held in abeyance until one of these two conditions is met.

IV. Claim Rejections Under 35 U.S.C. §112, first paragraph

Reconsideration is requested of the rejection of claim 12 for failing to comply with the written description requirement.

According to the relevant case law and guidelines of the MPEP as explained above in connection with the statement of claim amendments, it is clear that written description can be complied with if the description is enough to show that the inventor possessed the invention as claimed as of the original filing date and sufficiently described the invention to show possession. *Ipsis verbis* support is not the standard. As such, as long as the applicant's specification describes a polyelectrolyte film comprising a polyelectrolyte polymer and a perfluorinated charged particle in which the repeat units comprise at least two fluorine atoms in a manner sufficient to show the ordinarily skilled person that the inventor possessed such a film, the written description requirement is satisfied, and the rejection should be withdrawn.

The support stated for claim 12 above in connection with the Status of the Claims provides ample written description support for the film defined by claim 12. The definition of "perfluorinated" and description of the film itself, the method of making it, and of the particles is sufficient to show the ordinarily skilled person that the inventor possessed polymer films meeting all of the claim limitations of claim 12 as of the filing date of the application and that it was adequately

described as such. In view thereof, applicant respectfully requests the rejection be withdrawn.

V. Claim Rejections Under 35 U.S.C. §103(a)

A. Claims 1-4, 6, 28-29, 32-33, and 36-38

Reconsideration is requested of the rejection of claims 1-4, 6, 28-29, 32-33, and 36-38 as being obvious over Stevenson et al. (U.S. 2004/0191504) in view of Thompson et al. (U.S. 3,717,679) and Baur et al. (U.S. 5,563,016).

Claim 1 is directed to a polyelectrolyte film comprising an interpenetrating network of

-- a net positively charged polyelectrolyte polymer comprising repeat units with at least two fluorine atoms,

-- a net negatively charged polyelectrolyte polymer comprising repeat units with at least two fluorine atoms, and

-- further comprising a perfluorinated counterion within the bulk of the interpenetrating network of the net positively charged polyelectrolyte polymer and the net negatively charged polyelectrolyte polymer, the perfluorinated counterion comprising at least two fluorine atoms.

The perfluorinated counterion ion is located within the bulk of the interpenetrating network of the polyelectrolyte polymers, that is, the fluorinated counterion is located in the bulk of the film, as opposed to on the surface of the film. The film inherently comprises a bulk region and a surface region. See paragraph [0043], which describes the effect of such

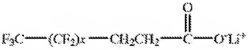
fluorinated counterions within the bulk of the film: These perfluorinated counterions have the advantageous effect that they ***enter the HFTFPC*** [highly fluorinated thin film polyelectrolyte complex], as shown in the example below, and open up sites within the HFTFPC for the transport of small cations, such as the proton. By opening up sites within the polyelectrolyte film, the film becomes permeable to small ions, exemplified by protons.

Claim 1 is both novel and non-obvious over the combination of references since the cited references do not disclose such a polyelectrolyte film nor provide any reason to prepare such a film. Stevenson et al. disclose a polyelectrolyte film deposited on a substrate comprising a positively charged polyelectrolyte and a negatively charged polyelectrolyte. The negatively charged polyelectrolyte is described starting at paragraph [0021], which discloses the structure of a polyacrylic acid-fluorocarbon modified polyacrylic acid co-polymer in which 0.1 to 90 mole percent of the acrylic acid repeat units are modified with alkyl groups R_3 and R_4. The R_3 group is at least one ethylene oxide repeat unit, while the R_4 group is a fluorinated hydrocarbyl comprising at least one carbon atom comprising multiple fluorine atoms. See paragraphs [0022] to [0028] of Stevenson et al.

Stevenson et al. also disclose positively charged polymers in paragraphs [0029]-[0031]. Paragraphs [0029]-[0030] show the structure of poly(allylamine hydrochloride). In paragraph [0031], Stevenson et al. state "Alternatively, the polycation may be a fluorinated polycation." Stevenson et al. do not show the structure of this fluorinated polycation. Accordingly, the Office has cited Thompson et al. and Baur et al. for disclosing polydiallyldiammonium polymers that comprise fluorinated repeat

units. Thompson et al.'s Example 7 discloses a method for homopolymerizing the monomer that was prepared according to the method described in Thompson et al.'s Example 2, which is a monomer comprising 15 fluorine atoms. Baur et al. also describe diallyldiammonium compounds. Baur et al. was cited for disclosing substituents that are bonded directly to the nitrogen atom, rather than through an oxygen atom, as disclosed in both Stevenson et al. and Thompson et al.

None of these references disclose a film in which a perfluorinated counterion comprising at least two fluorine atoms is located within the interpenetrating network of the fluorinated net positively charged polyelectrolyte polymer and the fluorinated net negatively charged polyelectrolyte polymer. Stevenson et al. disclose at paragraphs [0032] and [0033]:

> [0032] The ***uppermost layer*** of the coating comprises a compound having a fluoroalkyl group. Any compound containing a fluoroalkyl group may be suitable. Preferably, the fluoroalkyl group has the structure: 4
>
> 
>
> [0033] where x=0 to 50.

Any fluorinated ions disclosed therein are explicitly stated to be located on the uppermost, i.e., the surface, layer of the coating, rather than within the bulk of the interpenetrating network, i.e., the bulk, as required by the claims. In view thereof, Stevenson et al. do not disclose this claim requirement, nor do the cited Thompson et al. and Baur et al. references since these references which were cited for

disclosing certain types of polymers do not describe the types of polyelectrolyte films of Stevenson et al., which required both polycations and polyanions.

Additionally, the ordinarily skilled person would not have found any reason to modify the Stevenson et al. polyelectrolyte film by incorporating a fluorinated counterion within the interpenetrating network, as required by the claims. As stated in MPEP §2142:

> The key to supporting any rejection under 35 U.S.C. 103 is the clear articulation ***of the reason(s) why the claimed invention would have been obvious.*** The Supreme Court in *KSR International Co. v. Teleflex Inc.*, 550 U.S. ___, ___, 82 USPQ2d 1385, 1396 (2007) noted that the analysis supporting a rejection under 35 U.S.C. 103 should be made explicit. The Federal Circuit has stated that "rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006). See also *KSR,* 550 U.S. at ___ , 82 USPQ2d at 1396 (quoting Federal Circuit statement with approval).

In the present case, the Office must articulate a reason why the ordinarily skilled person would have altered the Stevenson et al. polyelectrolyte film, which calls for ***surface layer*** fluorinated ions ***only,*** in order to prepare a polyelectrolyte film in which a perfluorinated counterion within the interpenetrating network. The ordinarily skilled person actually would have avoided such a modification given Stevenson et al.'s disclosure. Stevenson et al. prepared their films as non-fouling coatings on a substrate. See paragraph [0004]: "The demand exists for coatings that are resistant to contamination." In view of this goal, Stevenson et al. sought

to prepare fluorinated polyelectrolyte films that are resistant to a wide variety of contaminants, including both water and oil. See paragraph [0009]: "Another object of the present invention is to prepare a uniformly coated substrate that is hydrophobic and/or oleophobic." The ordinarily skilled person would have concluded that Stevenson et al. sought to prepare polyelectrolyte films that are basically impermeable to water, oil, and other contaminants. As stated by the applicant at paragraph [0043], incorporating a perfluorinated counterion into the bulk region of their polyelectrolyte film actually makes the film more permeable to certain materials, in particular ions. Applicant's film is therefore permeable to certain materials, which sharply contrasts Stevenson et al.'s films for anti-contamination that the ordinarily skilled person would have understood should be impermeable in order to function as anti-contamination films.

Thompson et al. also state that a goal is the provision of "compositions useful as oil and water *repellents*." See Col. 1, lines 23-26. The ordinarily skilled person would have understood that Thompson et al.'s films (and Stevenson et al.'s films that also comprise polycation) should be repellent in order to function effectively as anti-contamination films.

Baur et al. merely describe a method of forming a positively charged polyelectrolyte and do not disclose any film forming methods or any properties of such films formed thereby. Baur et al. therefore would not have provided the ordinarily skilled person with any guidance toward forming films having all of the features required by claim 1.

Since Stevenson et al. and Thompson et al. explicitly desire non-fouling, anti-contaminating, oil and water repellent films, the ordinarily skilled person would have avoided

modifications like the perfluorinated counterion within the interpenetrating network of polyelectrolyte polymers required of claim 1, which increase the permeability of the film to certain charged materials. In view thereof, claim 1 is non-obvious over the cited references, and applicant requests the rejection be withdrawn.

Claims 2-4, 6, 28-29, 32-33, and 36-38 depend from claim 1 and are patentable for the same reasons as claim 1 and by virtue of the additional requirements therein.

B. Claims 5 and 8

Reconsideration is requested of the rejection of claims 5 and 8 as being obvious over Stevenson et al. (U.S. 2004/0191504) in view of Thompson et al. (U.S. 3,717,679), Baur et al. (U.S. 5,563,016), and Ijima et al. (U.S. 4,316,789).

Claims 5 and 8 depend from claim 1 and are patentable for the same reasons as claim 1 and by virtue of the additional requirements therein. Claims 5 and 8 define certain polyelectrolyte polymers that may comprise the polyelectrolyte polymers of the film of claim 1. Ijima et al. was cited for disclosing a particular negatively charged polyelectrolyte polymer, Nafion. Ijima et al. do not correct the deficiencies of the combination of Stevenson et al., Thompson et al., and Baur et al. since they do not disclose either of a polyelectrolyte film or a perfluorinated counterion, in particular a perfluorinated counterion that is within the interpenetrating network of the polyelectrolyte polymers nor provide any reason to prepare such a structure. In view thereof, applicant respectfully requests the rejection be withdrawn.

C. Claim 7

Reconsideration is requested of the rejection of claim 7 as being obvious over Stevenson et al. (U.S. 2004/0191504) in view of Thompson et al. (U.S. 3,717,679), Baur et al. (U.S. 5,563,016), and Umemoto et al. (U.S. 5,736,274).

Claim 7 depends from claim 1 and is patentable for the same reasons as claim 1 and by virtue of the additional requirements therein. Claim 7 defines a particular positively charged polyelectrolyte polymer that may comprise the polyelectrolyte polymers of the film of claim 1. Claim 7 is obvious over this combination since the cited Umemoto et al. does not disclose the fluorinated polyvinylpyridine structure defined by claim 7.

Umemoto et al. disclose various types of polymers comprising N-fluoropyridinium salts. None of the polymers disclosed therein have structures at all similar to the structure required by claim 7. Critically, Umemoto et al. disclose ***conjugated*** type N-fluoropyridinium polymers. The conjugated nature of the polymers is a critical component of such polymers, i.e., the principal of operation of the battery material requires conjugation in the N-fluoropyridinium polymer structure. Note the entire reference, but in particular, see:

-- the abstract, "A polymer containing a recurring unit of a ***conjugated*** N-fluoropyridinium salt...

-- Col. 1, lines 9-24, "...the present invention relates particularly to a novel ***conjugated*** N-fluoropyridinium salt-containing polymer as a battery material..."

-- Col. 2, lines 53-60, " In order to solve these problems, the present inventors ... have succeeded in synthesizing a polymer containing conjugated N-fluoropyridinium salts in which Π electrons can be ***conjugated,*** and have found ***such a polymer solves the***

above-mentioned problems, and thus completed the present invention."

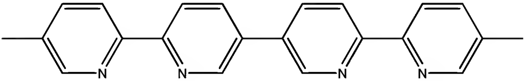
-- Col. 2, lines 63 et seq., "The present invention relates particularly to a ***conjugated*** N-fluoropyridinium salt-containing polymer which is an excellent battery material..."

-- The headings of every Table, and

-- All of the claims, e.g., Claim 1. A ***conjugated*** N-fluoropyridinium salt-containing polymer having a recurring unit...

Conjugated structures are those structures comprising a series of double bonded carbons connected by single bonds between carbons, as shown:

In some structures such as those disclosed in Umemoto et al., heteroatoms can be inserted into the series of conjugated double bonds. Nevertheless, conjugated bonds must comprise a series of single bond separated double bonds. In Umemoto et al., the conjugation is carried across single bond connected pyridines, e.g., Example 15 in Table 1:



In this structure, the bonds along the bottom half of the structure define the conjugated pattern of single-double-single-double-single-double-etc.

The conjugated aspect of Umemoto et al. is a critical feature of their invention, in other words, the principal of operation of their battery material as evidenced by their

disclosure at Col. 2, lines 53-60 that such a structure solves the problems mention in the Background section. Any modification of Umemoto et al. toward the structure of the polyelectrolyte polymer of claim 1 requires a disruption of the above described conjugation with a vinyl group connector. No such modification is anywhere suggested in Umemoto et al. since the Umemoto et al. inventors stated that it is the conjugated structure that solves the problems mentioned in the Background. Since the Office's proposed modification alters the very structure that solves the problem in the art, such a modification has been stated by the MPEP to be non-obvious. See MPEP 2143.01 Part VI.:

> **VI. THE PROPOSED MODIFICATION CANNOT CHANGE THE PRINCIPLE OF OPERATION OF A REFERENCE**
>
> If the proposed modification or combination of the prior art ***would change the principle of operation*** of the prior art invention being modified, ***then the teachings of the references are not sufficient to render the claims prima facie obvious.*** *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959) (Claims were directed to an oil seal comprising a bore engaging portion with outwardly biased resilient spring fingers inserted in a resilient sealing member. The primary reference relied upon in a rejection based on a combination of references disclosed an oil seal wherein the bore engaging portion was reinforced by a cylindrical sheet metal casing. Patentee taught the device required rigidity for operation, whereas the claimed invention required resiliency. The court reversed the rejection holding the "suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate." 270 F.2d at 813, 123 USPQ at 352.).

Herein, the changes to Umemoto et al.'s structure asserted by the Office to be obvious that require complete disruption of the conjugated structure across pyridine rings with a vinyl separator are so radical as to completely change the conjugation feature that is the principal of operation of the reference. As MPEP 2143.01 Part VI. points out, if it is necessary to change the principal of operation, the teachings of the reference are not sufficient to establish obviousness. Moreover, there is no evidence that such a modification would result in a polymer structure that successfully solves the problems mentioned in Umemoto et al.'s Background and could successfully be used as a battery material. The Office's asserted *prima facie* case of obviousness is therefore contrary to the case law and the guidelines of the MPEP and should be withdrawn.

In view thereof, Umemoto et al. would not have made the polymer structure of claim 7 obvious to the ordinarily skilled person. In fact, there appears to be no evidence in the art of record that fluorinated polyvinylpyridine polymers were known prior to applicant's discovery and disclosure. According to a decision handed down by the predecessor court to the Federal Circuit, the United States Court of Customs and Patent Appeals, in *In Re Spormann*, 363 F.2d 444, 150 USPQ 449 (CCPA 1966), "Obviousness cannot be predicated on what is unknown." Since the fluorinated polyvinylpyridine structure was entirely unknown prior to applicant's disclosure, the case law compels the conclusion that it could not have been obvious.

Umemoto et al. also do not correct the deficiencies of the combination of Stevenson et al., Thompson et al., and Baur et al. since they do not disclose a polyelectrolyte film comprising both a positively charged polyelectrolyte polymer and a negatively charged polyelectrolyte polymer and a perfluorinated

counterion that is within the interpenetrating network of such polyelectrolyte polymers nor provide any reason to prepare such a structure. In view thereof, applicant respectfully requests the rejection be withdrawn.

D. Claims 9-11

Reconsideration is requested of the rejection of claims 9-11 as being obvious over Stevenson et al. (U.S. 2004/0191504) in view of Thompson et al. (U.S. 3,717,679), Baur et al. (U.S. 5,563,016), and Kim et al. (U.S. 7,357,999).

Claims 9-11 depend from claim 1 and are patentable for the same reasons as claim 1 and by virtue of the additional requirements therein. Claims 9-11 further define the polyelectrolyte film of claim 1 by requiring the film comprise certain types of particles. Kim et al., like Ijima et al., merely disclose a membrane comprising Nafion, but Kim et al.'s membrane is further modified with silicate particles. Kim et al. do not correct the deficiencies of the combination of Stevenson et al., Thompson et al., and Baur et al. since they do not disclose a polyelectrolyte film and a perfluorinated counterion, particularly a perfluorinated counterion that is within the interpenetrating network of the polyelectrolyte polymers nor provide any reason to prepare such a structure. In view thereof, applicant respectfully requests the rejection be withdrawn.

E. Claim 12

Reconsideration is requested of the rejection of claim 12 as being obvious over Wu et al. (U.S. 2003/0169227).

Claim 12 is directed to a film comprising:

-- a charged polyelectrolyte polymer comprising repeat units with at least two fluorine atoms and

-- a perfluorinated charged particle comprising repeat units with at least two fluorine atoms, wherein the charge of the polyelectrolyte polymer is opposite that of the charge of the perfluorinated charged particle.

The Office has asserted that "**Wu et al** discloses a combination of opposite charged (one - electron accepting, the other - electron accepting) polymers, both being fluorinated." The assertion that Wu et al. disclose that both of the polymers are fluorinated is incorrect. Wu et al. do not disclose any such combination asserted by the Office and in fact do not disclose any film comprising a charged polyelectrolyte polymer comprising repeat units with at least two fluorine atoms and a perfluorinated charged particle of opposite charge of the polyelectrolyte polymer, nor would they have made such a combination obvious.

Wu et al.'s abstract was specifically cited by the Office. Their abstract states the following:

> The invention relates to a novel electrophoretic dispersion comprising a fluorinated solvent as the continuous phase, charged pigment particles or pigment containing microcapsules as the dispersed phase, and the charge of the pigment particles is provided by a charge controlling agent comprising:
>
> (i) a soluble fluorinated electron accepting or proton donating compound or polymer in the continuous phase and an electron donating or proton accepting compound or polymer in the dispersed phase; ***<u>or</u>***
>
> (ii) a soluble fluorinated electron donating or proton accepting compound or polymer in the continuous phase and an electron accepting or proton donating compound or polymer in the dispersed phase.

Wu et al.'s abstract is a concise explanation of the electrophoretic toner disclosed therein.

As stated in the Abstract, the dispersion comprises a fluorinated solvent. Solvents are discussed in Wu et al.'s specification at paragraphs [0047]-[0048]. These solvents include perfluoroalkanes, perfluorocylcoalkanes, perfluoroarylalkanes, perfluoro-tert-amines, perfluoropolyethers, hydrofluoropolyethers, and the like. Solvents such as the perfluoroalkanes, perfluorocylcoalkanes, perfluoroarylalkanes, perfluoro-tert-amines are not polymers. Moreover, they are not stated to be charged. The solvents such as perfluoropolyethers and hydrofluoropolyethers, while polymers, are not charged. As such none of the perfluorinated solvents disclosed in Wu et al. are either of a charged polyelectrolyte polymer comprising repeat units with at least two fluorine atoms or a perfluorinated charged particle comprising repeat units with at least two fluorine atoms.

Dispersed within the fluorinated solvent are pigment particles. The pigment particles are disclosed in paragraphs [0049]-[0050]. These include organic and inorganic pigments such as TiO_2, phthalocyanine blue, phthalocyanine green, and so on. Pigment particles are not stated to be fluorinated, nor are they polymers. In view thereof, none of the pigment particles are either of a charged polyelectrolyte polymer comprising repeat units with at least two fluorine atoms or a perfluorinated charged particle comprising repeat units with at least two fluorine atoms.

Optionally, the pigment particles can be microencapsulated, as described in paragraphs [0051]-[0054]. The reactive monomers are described in paragraph [0054], including isocyanates, thioisocyanates, epoxides, acid chlorides, alcohols, thiols,

amines, and the like. These reactants are known to form polymers of the polyurea and polyurethane type. These polymers are neither charged nor fluorinated. Accordingly, none of the microencapsulated pigment particles are either of a charged polyelectrolyte polymer comprising repeat units with at least two fluorine atoms or a perfluorinated charged particle comprising repeat units with at least two fluorine atoms.

The pigments, microencapsulated or not, are charged by the so-called charged controlling agent, or CCA. Paragraphs [0064]-[0066] of Wu et al. describe two embodiments of the CCAs:

> [0065] (i) a soluble ***fluorinated*** electron accepting or proton donating compound or polymer in the continuous phase and an electron donating or proton accepting compound or polymer in the dispersed phase; ***or***
>
> [0066] a soluble ***fluorinated*** electron donating or proton accepting compound or polymer in the continuous phase and an electron accepting or proton donating compound or polymer in the dispersed phase.

In the first embodiment, described in paragraph [0065], the electron accepting compound or polymer in the continuous phase is stated to be fluorinated. Notably, in this embodiment, the "electron donating or proton accepting compound or polymer in the dispersed phase" ***is not fluorinated***.

In the second embodiment, described in paragraph [0066], the electron donating compound or polymer in the continuous phase is stated to be fluorinated. Notably, in this embodiment, the "electron accepting or proton donating compound or polymer in the dispersed phase" ***is not fluorinated***.

The "or" between these two paragraphs make it abundantly clear that these two paragraphs describe two different embodiments. There is no combination described anywhere in Wu

et al. in which fluorinated materials are used in both the continuous and dispersed phase. Accordingly, the Office's assertion that **"Wu et al** discloses a ***combination*** of opposite charged (one - electron accepting, the other - electron accepting) polymers, ***both being fluorinated***" is simply incorrect. No such combination is disclosed. Paragraphs [0065] and [0066] describe two separate embodiments in which there is no combination of two fluorinated materials.

The Office's assertion is further incorrect since the fluorinated materials in both embodiments are ***only located in the continuous phase***. No fluorinated material is stated to be located in the dispersed phase, i.e., as a coating on the particles. Wu et al.'s particles are not coated with fluorinated materials, polymers or otherwise, or are otherwise in any way constructed using fluorinated materials. The particles comprise a pigment shell, an optional microencapsulating material such as a polyurea, and either an electron donating or proton accepting compound or polymer or an electron accepting or proton donating compound or polymer -- neither of which contain fluorinated materials. Simply stated, there are no fluorine atoms on the particles at all.

Wu et al.'s examples further show that the particles comprise no fluorinated materials. The following table shows the materials used to prepare the coated pigment particles in certain of Wu et al.'s examples:

Example Number	**Particle/ Pigment Material**	**Optional Microencapsulating Material**	**Charge Control Agent**
Comparative 1	Acrylic particle	None	None
2	Acrylic particle	None	Copolymer of 4-vinylpyridine and butyl methacrylate
Comparative	TiO_2	Modified Acrylic	None

3		Resin	
4	TiO_2	Modified Acrylic Resin	Copolymer of 4-vinylpyridine and butyl methacrylate
5	TiO_2	Modified Acrylic Resin	Copolymer of 4-vinylpyridine and butyl methacrylate
6	TiO_2	Modified Acrylic Resin	Copolymer of 4-vinylpyridine and butyl methacrylate
8	TiO_2	Modified Acrylic Resin	Polyacrylic acid
Comparative 9	TiO_2	Modified Acrylic Resin	Copolymer of 4-vinylpyridine and butyl methacrylate
Comparative 10	TiO_2	Modified Acrylic Resin	Polyacrylic acid

In Examples 3 through 10, polymer coated TiO_2 sold under the trade name TINT-AYD® PC9003 was used. This material comprises titanium dioxide pigment coated with modified acrylic resin. See the attached MSDS of TINT-AYD® PC9003. Table 1 on page 10 of Wu et al.'s published application confirms that the copolymer of 4-vinylpyridine and butyl methacrylate is the active group on the particles -- this material is ***not fluorinated***. The Krytox of Examples 4, 5, and 6, which is fluorinated carboxylic acid, is the ***soluble*** CCA in ***the continuous phase***, i.e., it is not a particle coating. See also paragraph [0071] of Wu et al.

These examples confirm that neither the pigment particle nor its coating materials contain any fluorine atoms at all. There is thus ***no*** "combination of opposite charged (one - electron accepting, the other - electron accepting) polymers, both being fluorinated..." The only fluorinated materials are soluble materials in the continuous phase, and not on the particles.

Additionally, the Office's asserted combination would not have been obvious in view of Wu et al.'s disclosure. Wu et al.

disclose only the two embodiments, in which fluorinated material is present only in the continuous phase. If Wu et al. contemplated other combinations, they would have disclosed them, but they did not. Only through the improper use of hindsight could one suggest that the ordinarily skilled person would have found it obvious to make a combination that Wu et al. failed to contemplate or provide any reason to make. Thus, Wu et al. would not have provided the ordinarily skilled person with any reason to prepare particles with fluorinated materials.

Finally, it is also notable that the fluorinated materials for use in the continuous phase are not polyelectrolyte polymers. The fluorinated material shown, for example, at paragraph [0072] is neither multiply charged (polyelectrolyte) nor a polymer. The material shown at [0079], while being a polymer, is not multiply charged and is thus not a polyelectrolyte. For failure to disclose any fluorinated polyelectrolyte polymers, Wu et al. would not have made the film defined by claim 12 obvious.

Inasmuch as Wu et al. fail to disclose any particle comprising any fluorine atoms and further fail to disclose fluorinated polyelectrolyte polymer, applicant respectfully requests that the rejection of claim 12 over Wu et al. be withdrawn.

F. Claim 13

Reconsideration is requested of the rejection of claim 13 as being obvious over Wu et al. (U.S. 2003/0169227) in combination with Hiro et al. (U.S. 4,863,823).

Claim 13 depends from claim 12 and is patentable for the reasons stated above in connection with claim 12 and by virtue of the additional requirements therein. Hiro et al. fail to

correct the deficiencies of Wu et al. inasmuch as they do not disclose any polymer that is also a polyelectrolyte. The fluorinated monomers disclosed in Col. 4, starting at line 42 and the non-fluorinated monomers disclosed in Col. 5, starting at line 41 both polymerize into neutrally charged polymers. In view thereof, the combination of Wu et al. and Hiro et al. fail to disclose fluorinated polyelectrolyte polymer.

G. Claims 30 and 31

Reconsideration is requested of the rejection of claims 30 and 31 as being obvious over Stevenson et al. (U.S. 2004/0191504) in view of Thompson et al. (U.S. 3,717,679), Baur et al. (U.S. 5,563,016), and Stirniman et al. (U.S. 6,355,300).

Claims 30 and 31 depend from claim 1 and are patentable for the same reasons as claim 1 and by virtue of the additional requirements therein.

Stirniman et al. do not correct the deficiencies of the combination of Stevenson et al., Thompson et al., and Baur et al. and thus would not have made it obvious to apply the polyelectrolyte film of claim 1 to a rotating disc magnetic storage medium ("fixed disc"), as required by claims 30 and 31. Stirniman et al. disclose at col. 3, lines 42-63, various lubricants for magnetic recording media, including perfluoropolyethers, functionalized perfluoropolyethers, perfluoropolyalkylethers, and functionalized perfluoropolyalkylethers. Since Stirniman et al.'s mechanism for depositing the lubricants was by vapor deposition, they observed at col. 3, line 64 to col. 4, line 15, that it was advantageous to use lower molecular weight fluorinated polymers as lubricants. Stirniman et al.'s polymers are neutrally charged polymers, unlike the polyelectrolyte polymers used to form the

polyelectrolyte films and the perfluorinated counterion of claims 30 and 31.

Thus, the combination of Stevenson et al., Thompson et al., Baur et al., and Stirniman et al. do not disclose any polyelectrolyte film comprising an interpenetrating network of a net positively charged polyelectrolyte polymer comprising repeat units with at least two fluorine atoms and a net negatively charged polyelectrolyte polymer comprising repeat units with at least two fluorine atoms and a perfluorinated counterion within the interpenetrating network of polyelectrolyte polymers, nor would the combination have provided any reason to prepare such a film. The polyelectrolyte film is non-obvious over Stevenson et al., Thompson et al., and Baur et al. for reasons already stated herein.

Stirniman et al.'s disclosure would not have made the polyelectrolyte film any more obvious to the ordinarily skilled person and in fact would have led the skilled person away from using such a film in their method for protecting magnetic surfaces. Stirniman et al.'s deposition method requires the vaporization of the lubricant material. Low molecular weight, neutrally charged fluorinated polymers are appropriate for such a deposition method since such polymers may be vaporized. Highly charged polyelectrolyte materials are not easily vaporized. In fact, it is known that ionic materials tend to have high melting and boiling points. Sodium chloride, for example, has a melting point of 801°C and a boiling point of 1465°C. The polyelectrolyte polymers and perfluorinated counterion of the film of claim 1 similarly have high boiling points and are thus not easily vaporized. In view thereof, the ordinarily skilled person would not have found any reason to

employ fluorinated polyelectrolyte polymers in the context of Stirniman et al.'s method.

In view of the foregoing, applicants respectfully submit that the films defined by claims 30 and 31 are non-obvious in view of the combination of Stevenson et al. and Stirniman et al. and respectfully request the rejection be withdrawn.

VI. New Claims

Claims 39-41 are new. These claims are patentable since none of the cited references disclose any polyelectrolyte film further comprising these claims features. In view thereof, applicant respectfully requests allowance of these claims.

CONCLUSION

Applicant does not believe that a fee is required for the filing of this response, as it is being submitted within the two month shortened statutory period for reply. Should applicants be incorrect, the Commissioner is hereby authorized to charge the necessary fee to Deposit Account No. 19-1345.

Respectfully submitted,

/paul fleischut/

Paul Fleischut, Reg. No. 35,513
SENNIGER POWERS LLP
100 North Broadway, 17th Floor
St. Louis, Missouri 63102
(314) 231-5400

PIF/NAK/mrt